The Cary Arboretum

of The New York Botanical Garden

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Environmental Resource Center at Cary Recommended by Student Task Force

An Environmental Education Resource Center for Mid-Hudson Valley educators is a much needed facility. This is the conclusion of seven students from the State University of New York at New Paltz, who studied the situation, under sponsorship of the College's Innovative Studies and Continuing Education Department, in conjunction with the Cary Arboretum.

The New Paltz undergraduates – all of whom had training in botany, art, education, pre-environmental law, and environmental science – participated in an intensive three-week internship program in order to assess the status of environmental education resources in the area and to make recommendations for a center at the Cary Arboretum.

The students presented their findings to a group of educators and other interested individuals from the region who attended a recent luncheon meeting at Bennett College.

The report, "Planning an Environmental Education Resource Center for the Mid-Hudson Region", pointed out the universal interest by area educators in a teacher-oriented environmental resource center. Such a center would provide teachers with the support needed for developing environmental programs in their classrooms.

"Before teachers can effectively incorporate environmental education into their curricula, they must feel confident in their own understanding of the subject," the report emphasized.

Preparing teachers to incorporate environmental education into existing curricula would be one of the prime objectives of the proposed resource center.

To implement this objective, printed matter, audio-visual materials, simulation games, production materials, and classroom equipment would be available for professional use at the center.

In addition, a series of teacher workshops on specific aspects of the subject would be offered. A survey conducted by the seven students indicated the following topics should be stressed in the workshops: energy-fuel supplies, new systems and concepts of energy (geothermal, solar, and nuclear), and power generation; environmental awareness (including hiking, camping, and weather forecasting); pollution (air, water, noise, and visual); natural environments (endangered species, habitats, and survival); and land use (open space, scenic and historic preservation, recreation, planning, and construction).

The student task force suggested that the center serve as a liaison among the Mid-Hudson environmental organizations, in order to facilitate the dissemination of environmental information. In addition, they strongly urged that students be offered environmental internships.

The resource center is to be located in the Arboretum's new education building – the Gifford House on the Sharon Turnpike in Millbrook – which is now being renovated.

Dr. Peter Dykeman, coordinator of education at Cary, said the resource center, to be established early in the fall, will initially function on a preliminary basis, and will be enlarged as additional funds become available.

Dr. Richard McBride, professor of elementary science education, SUNY, New Paltz, and Dr. Dykeman were advisors for the project. The seven students who prepared the report were: Pat Corrigan, Fran Goering, Paul Huth, Sharon Litwin, Dale Melville, Michael Schuit, and Susan Seecof. Ann Councill, an environmental education information specialist, provided guidance in obtaining resource materials for the study and contributed ideas for recommendations.

Renovation is progressing at Gifford House, to convert it for use as the Arboretum's education building. Environmental Resource Center will be located in one of the newly refurbished rooms.

How To Raise Vegetables and Flowers From Seed

by Paul E. Mihan, Plant Propagator

Whether you're ready or not, spring is on its way – a time of year when gardeners' thoughts turn to vegetable and flower gardens. This year, why not save some money and have a little fun in the process, by starting your own vegetable and annual flower plants indoors? To get the most out of the growing season in this area, vegetable and annual flower seed should be started indoors around mid-April.

Here's What To Do

(1) Never use soil to germinate seed. Soil usually packs hard around seedlings, making it difficult to remove and separate them at transplanting time. In addition, garden soil usually comes with insect and disease problems that can spell disaster for small seedlings. I recommend purchasing one of the soil-less commercially prepared mixtures used for germinating seeds. You might also like to mix your own. At the Arboretum we make a seed germinating mixture consisting of one part milled sphagnum and one part white builders' sand (equal parts by volume). Never use beach sand, as it is coated with salt.

(2) Wet the seed mixture and work it well so that it is thoroughly moist. If you can squeeze excess water out of it, it's too wet. (This should also be the moisture condition of the potting mixture). It is important that the mix be moist prior to sowing your seed. If you try to wet the mix after sowing you will end up washing many seeds away.

(3) Fill a shallow container, such as a pie plate, with drainage holes punched in the bottom and level the seed mixture carefully. If the mixture is not level, some seeds will be in holes and always wet, while others will be on hills and tend to dry out.

(4) Sow the seed carefully over the top of the seed mixture, being careful not to over-seed. You should be able to see mixture between each seed. One pie plate six inches in diameter will provide space for more than 200 seedlings.

(5) Now cover the seed carefully with the moistened mixture. A good way is to put the mixture into a kitchen strainer and shake it evenly over the top of the seed. Seed should be covered with twice as much mixture as a single seed is wide.

(6) Put your seed pot in a place where it will receive ample indirect sunlight. The temperature should be between 62°-75° F. Ventilation is important and fresh air should be supplied. Humidity is also important. If your house is dry and hot, fill a shallow tray with gravel, set your seed pots on it, and add a little water to the gravel every few days. This is also recommended for house plants that need increased humidity and suffer in the desert-like conditions of some homes during winter months.

(7) Water the seed pots from the top with a bulb sprinkler, similar to the one used for moistening clothes when ironing. The sprinkler is sold commercially at most garden centers under the name "centrospray." A watering can may be used, but be careful not to apply too much water or seeds will be washed away. Provide water only when the top of the mix *starts* to feel dry to the touch. *Do not* allow seed pots to dry completely between waterings, as this will upset the germination process. However, be careful in your watering. Overwatering is the main reason why most people are unsuccessful with plants.

Bonnie Fiero, Arboretum gardener in charge of greenhouses, is shown transplanting seedlings into pressed peat pots (see steps 8 and 9)

Hold seedlings, when transplanting, by a leaf – not by stem (see step 9)

(8) While you are waiting for germination (2-3 weeks) prepare for the next step by blending the potting mixture. The standard horticultural potting mixture is composed of one part white builders' sand ("perlite" may be substituted for sand), one part "sterilized" soil, and one part fine peat moss. These three components are combined in equal parts by volume. Water is then added while blending to thoroughly moisten the potting mix. Please notice that I feel it is well worth the investment to purchase good quality, clean top soil. This is readily available in most garden centers in amounts ranging from two pounds to fifty pounds. However, *do not use it* straight from the bag. Always blend with sand and peat as stated above. The sand opens the mixture up and provides for good aeration and drainage. The fine peat moss increases the water holding capacity of the soil. Soil alone will cake, get hard, and not allow for proper air and water movement through the soil.

Remember, although the bag might indicate that the soil inside is potting soil, it probably is not. Unless it has been premixed, it is just plain "sterilized" top soil, and prior to using it to pot any of your house plants or seedlings always mix it first. What I usually recommend is that home owners mix a large amount of potting mixture at one time and store it in a garbage can; then it is readily available whenever a plant is ready to be potted into the next size pot. This mixture can be used successfully with most types of house plants.

I feel it is easiest and best to transplant seedlings into pressed peat pots. These are called "Jiffy Pots" and are made of dry, pressed peat moss. These pots should be filled three-quarters full of the potting mixture. It is also a good idea to purchase a few plastic or wood flats to hold the peat pots. Be sure the flats have holes in the bottom for good drainage.

(9) Your seedlings are ready to come out of the seed pots when they have their first set of true leaves. The first leaves are the seed leaves or cotyledons; the true leaves look more like real leaves and are formed above the cotyledons. Using your finger, push down into the seed pot and push a clump of seedlings up and out. Holding an individual seedling by a leaf (not by the stem), separate it from the clump. Make a hole in the potting mixture and slowly lower the root system of the seedling down into the hole; then gently firm and mix around the stem so that the seedling is standing. Prior to transplanting, it is important to water the filled Jiffy Pots well. Then allow them to drain for a few hours. In this way you are transplanting the seedling into a moist

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Survival Testing For Foreign Plants

Tests of plants from all over the temperate regions of the world are underway at the Arboretum. The goal, says horticulturist Robert Hebb, who is in charge of the testing program, is to discover types of plants that have never been tried in the Hudson Valley, yet may prove able to survive the climate of this area.

The program holds out the possibility of significantly expanding the number of plants that can be used by Hudson Valley gardeners.

Two years ago, Mr. Hebb reports, the Arboretum began to test approximately 600 species of plants, and new species have been added annually since. The quality being sought can be expressed in one word: hardiness. Specimens are carefully raised, mainly from seed, in the Arboretum greenhouses, during spring and summer, and kept during winter in a cold storage building that maintans a constant temperature just above freezing.

New plants alternate between growing in the greenhouse and dormant periods in the cold storage building for about two years. Temperate zone woody plants must undergo a period of cold-induced dormancy during winter months or else they languish and eventually die. At the end of this cycle, young plants are placed in the lath house (a special outside structure that provides shade for young plants) where eventually they'll receive their first real taste of a Hudson Valley winter.

During this outdoor stage, the Arboretum records temperatures plants are exposed to, the duration of temperature extremes and the exact time of year unfavorable low temperatures occur. Maximum and minimum readings are recorded twice daily.

The timing of low temperatures is very important to plant survival. According to Mr. Hebb, most people think January and February are the critical months for low temperature injury. This is not necessarily so. According to Mr. Hebb: "Many plants can withstand -10° F or lower in January and February while completely dormant. But, if exposed to such extreme cold in early December or March, they might be severely injured or killed. Damage from low temperature is most likely to occur when plants approach their dormant period or as they are coming out of it."

Other important factors affecting plant survival include: available water in winter; exposure to wind and sun (serious injury can occur when plant stems or trunks warm up by direct exposure to sunlight and then are rapidly cooled in late afternoon by plummeting temperatures); general well being of the plant prior to winter, and – for some low growing species – the amount of snow cover. Snow acts as an excellent mulch or insulating blanket for roots and exposed plant parts.

Many broad-leafed evergreens or conifers are damaged when frozen ground does not allow roots to absorb water. This frequently results in browning or death of leaves or needles and, in severe instances, death to branches or plant. Young or newly transplanted evergreens are more susceptible than well established mature specimens.

Wood chips, pine needles or similar materials will protect roots. Planting tender specimens on the north side of a building or on a slope with a northerly exposure reduces the amount of direct sunlight and thus the possibility of abrupt changes in temperature affecting plant trunks or stems.

When will the Arboretum know what new plants will survive in the Hudson Valley? Although a number of new plants have shown promise in their adaptability to this region, no conclusive evidence can be ascertained at this time, Mr. Hebb said. "Many plants will require several years of patient observation before they can be recommended for wider use in our area."

The Arboretum also wants to see the results after this year's severe winter before making any positive assertions. A recent inspection seems encouraging. The Arboretum's collection of rare conifers and broad-leaved evergreens has revealed only minimal damage to date. In fact, some plants which were severely damaged last winter appear in good condition now. What happens in late February and March will tell the final tale.

If many plants prove to be hardy and can withstand our winters, we in the Hudson Valley will be able to add new species to our gardens, yards, parks and streets. They will not only provide new beauty, but will also help replace existing varieties which are not as adaptable to changing environmental conditions.

Around The Arboretum

College Connection

Academic ties between the Cary Arboretum and the College of Forestry and Environmental Science, SUNY, in Syracuse are being rapidly developed.

Under terms of a general cooperative agreement signed last year, three Cary scientists, Drs. Thomas Elias, David Karnosky and Edson Setliff, have received adjunct faculty status at SUNY.

Already one graduate student from SUNY, Keith Redenbaugh, is at work on a Cary program – research involving American elm breeding.

Saving Fuel – at Home

In time for the next heating season, the Cary Arboretum will test an innovative new method of reducing fuel consumption for heating its greenhouses.

The new technique involves covering the greenhouses with plastic sheeting. This will minimize heat loss at night, while still admitting heat from the sun during the day.

Staff members of the Arboretum recently visited a large greenhouse in Ohio that has tried the system and achieved a 50% reduction in heating costs.

A low winter sun illuminates geometrically designed beam being lowered into position at the Arboretum's solar-heated Plant Science Building. The laminated Douglas Fir beams will support huge solar collectors which will provide most of the building's heat.

To cut down heating costs in other Arboretum buildings, three wood-burning stoves have been ordered. In addition, possibilities of installing a wood-burning furnace in at least one of the Arboretum's older buildings are being investigated.

Fallen timber and scrap wood from necessary pruning and clearing operations at the Arboretum generate an ample firewood supply.

. . . and Abroad

Arboretum scientists, retained by the Brazilian government to give environmental advice, are urging the Brazilians to make maximum use of the inexhaustible supplies of wood in the Amazon forest as a prime energy source.

Dr. Robert Goodland, the Arboretum ecologist, recently delivered a paper in Brazil advocating that wood be used to provide power for inland transportation (river steamers); to produce alcohol and charcoal, and to produce liquid fuel by pyrolysis and hydrogenization.

Sawdust is also strongly recommended by Dr. Goodland as a fuel source. "A sawmill powered by sawdust is the only energy system except for the fast breeder

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nuclear reactors, to produce more fuel than it consumes," he said.

A Course for Brazil

Drs. Goodland and Tillman of the Arboretum staff have recently been in Brazil to plan that country's first college course in applied environmental science.

The course would be tied in with a vast hydroelectric project in northern Brazil for which Dr. Goodland has been retained as environmental advisor. The students would use the hydro project as their outdoor laboratory.

The Ford Foundation has retained Dr. Tillman as a consultant for the preliminary planning phases of the training project.

Arboretum Receives Memorial Gifts

Two area institutions made gifts to the Cary Arboretum in memory of Mrs. Winifred Milczewski of Verbank, who died as the result of the car-school bus accident that occurred during icy road conditions January 12 on Route 44.

The Millbrook School, where Mrs. Milczewski's daughter Sherry is a day student, donated $35, and The Separator Group of the De Laval Separator Company, where Mrs. Milczewski worked, contributed $25.

Mrs. Milczewski had taken courses at the Arboretum and was actively interested in its programs and development. According to her friends, she loved nature and enjoyed being outdoors.

The Arboretum plans to use the money contributed in her memory to purchase books for the Cary library. The books will be inscribed with a commemorative bookplate.

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potting mix. If you try to wet the mixture and the dry peat pot after the transplanting operation, you will wash away many of the seedlings.

(10) The flats of seedlings should be watered with a sprinkling can, and great care should be taken not to overwater. Keep the flats in a warm place with ample sunlight, and fertilize the seedlings every three weeks with a weak solution of a water soluble fertilizer. This solution can be mixed in your watering can and applied over the top of the plants, just as you would water. After all danger of frost is over (to be safe, wait until after Memorial Day), start to harden off your plants. The term "hardening off" refers to placing "pampered" plants outside to condition them gradually to cooler temperatures and alternating amounts of water. The whole process usually takes four to five days. On the first day move the plants outside to a sheltered location for a few hours in the afternoon. Then gradually increase the length of time plants are allowed to stay outside. On or about the fifth or sixth day let them remain outside all day and night. Also, during this stage, do not water as frequently or as much. There is nothing magical about this process; it is merely a gradual transition which gives the plant a chance to adjust as you move it from one environment to another. Gradual hardening is also a good practice to follow when you move house plants outside for the summer.

When your garden soil has been prepared, plant the entire peat pot in the ground. It will decay in time, and therefore it does not have to be removed. Water your newly planted seedlings, and you will be on your way to a summer's worth of enjoyment.

Happy Gardening!

THE CARY ARBORETUM
of
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